Weed Watchin'

An Annual Newsletter for Volunteer Weed Watchers

Published by the New Hampshire Department of Environmental Services, Summer 2005

Variable Milfoil is the Focus of Intensified Scrutiny in State

By Amy P. Smagula, DES Exotic Species Program Coordinator

In fall 2004, New Hampshire was the recipient of nearly $1 million of federal appropriations that were earmarked for research on variable milfoil (*Myriophyllum heterophyllum*). The DES Exotic Spcies Program is implementing the grant program.

Variable milfoil is the number one aquatic plant problem for lake residents, visitors, and aquatic plant managers in New Hampshire. Spreading at an historic rate of one to three new waterbodies each year since the 1980s, the plant is on the move, and taking over lakes at an alarming rate. Current management strategies are short-lived, and lake residents are becoming increasingly more frustrated with the problem.

Boat engine cutting through variable milfoil on Lake Winnipesaukee

Though DES recognizes that complete eradication of this plant is not a possibility, we want to learn more about the plant, the habitats it invades, and possible control measures to provide longer-term control than we are currently capable of. As a result, in winter 2003, DES sent out a request for conceptual proposals to research entities in New Hampshire and surrounding states to solicit proposals for work related to variable milfoil.

A total of 13 conceptual proposals were submitted to DES in spring 2004. After two rounds of reviews, including individual reviews by a committee of five, and personal presentations and interviews with the top eight candidates from the individual projects, and lead researchers for the milfoil grant awards reviews, DES has selected six finalists for the grant funds. The

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VOLUNTEERS NEEDED!

If you are interested in participating in the Volunteer Weed Watcher Program, or if you would like a refresher training session, please contact Amy Smagula at (603) 271-2248 or asmagula@des.state.nh.us. If you see anything even remotely suspicious, collect a representative sample of the plant (preferably with seeds or flowers), wrap it in a moist paper towel, seal it in a plastic baggie, and deliver or send it to the DES Limnology Center, PO Box 95, 29 Hazen Drive, Concord, NH 03302-0095.

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Native Plant Focus

Bladderwort – Utricularia spp.

By Alicia Lane, DES Program Assistant

Many people may be unaware of the fact that there is a carnivorous plant species lurking submersed in many of our New Hampshire water bodies. Bladderwort, a native plant in New Hampshire, can be found floating horizontally beneath the water surface or in tangled masses on the surface of lakes and ponds. Bladderwort is not a rooted plant, and as a result, the plant can be moved merely by the wind or water currents. The plant's beautiful, orchid-like flowers, which are most often yellow, but can also be purple to whitish, can be seen sticking above the surface of the water in the summer months.

Bladderwort received its common name from the unique bladder-like structures found on its leaflets. These structures are often confused as seeds or air sacs on the plant but, in reality, bladders are small, deflated, stomach-like sacs. Several hundred of these small "stomachs" can be found on a single plant! The bladders function as a trap used to catch prey. On the outside of the trap are small trigger-like hairs which, when bumped by disturbances, abruptly open and suck in water and nearby aquatic critters.

Once inside the bladder, these critters are attacked by enzymes and bacteria that digest them for their nutrient content. This process can take a few minutes to a few hours, depending on the size of the prey. When completed, special cells extract the nutrient-rich water from the bladder and into the stem.

The bladderwort's diet often consists of various microscopic and macroscopic animals, including *Daphnia*, copepods and others.

Bladderwort is commonly confused with many native and exotic look-alike plants. Native coontail and water marigold, and exotic milfoil and fanwort are all commonly confused with bladderwort.

Bladderworts are not readily eaten by plant grazers in waterbodies, but some species of ducks will feed on the plant. White-tailed deer, moose and muskrats have also been noted to feed on this amazing little plant.

The summer of 2005 seems to be a good year for bladderwort. Many residents from our lakes and ponds across the state have contacted DES with concerns about the prolific nature of this plant. It is likely that next summer we'll all notice a repreive from the thick growths, as bladderwort tends to have cycles of thick growth one year, followed by a year or two of thinner growth.

EXOTIC AQUATIC PLANT ALERT!

Water Hyacinth (*Eichhornia crassipies*)

By Erika Haug, DES Program Assistant

The water hyacinth is a free-floating member of the pickerel weed family that ranges in size from a couple centimeters to a meter in length. The plant has purple or bluish flowers with six petals, with one containing a distinctive yellow spot. The leaves of the plants are waxy and rounded. The attractiveness of this plant is what makes it so popular in home water gardens.

Unfortunately, behind this beautiful flower lies an aggressive plant with a weedy nature that is capable of causing the eradication the native plants and wildlife from a waterbody. The reason for this weedy nature is the result of the plant's adaptations to be rather prolific in fresh water systems. Frighteningly, one plant can produce up to 3,000 offspring in approximately a month an a half. Because of this, it has been named one of the most productive plants on earth.

As an invasive species in fresh water lakes, especially in warmer regions of the country such as Florida, the water hyacinth forms thick dense mats on the surface of the water. The native plants growing beneath these mats are shaded and can no longer compete for sunlight. Consequently, the lack of photosynthesis by submersed plants decreases the amount of dissolved oxygen in the water body. Also, when these thick mats of water hyacinth die off in the winter, they leave behind a great amount of decomposing biomass. Bacteria decomposing this material use oxygen from the water as part of this metabolic process. A low level of dissolved oxygen in the water will suffocate fish and macro-invertebrates. Nutrients liberated from the decomposing plant materials can lead to algal blooms in the water as well.

There are several methods used to control the spread of this weed. For small infestations, physical removal of the water hyacinth is the best solution. Physical removal can be accomplished through the use of machines or mere hand pulling. With larger infestations, biological control is a better option. In this case, various bugs such as the water hyacinth weevil (*Neochetina eichhorniae*), the chevroned water hyacinth weevil (*Neochetina bruchi*), and two moth species *Niphograpta albiguttalis* and *Xubida infusella* are employed to eat away at the water hyacinth. The weevils feed on the leaves of the hyacinth while the moth larva attack the buds of the plants. Another method of control is herbicide application. Because this plant grows across the surface of the water, it is difficult to make the chemicals stick to the plants, therefore chemical treatments are not always effective.

The water hyacinth has not yet been made illegal in New Hampshire due to its inability to survive the cold winters. However its over-productive tendencies should make you think twice about planting it in your home water garden. Though it can't survive our winters, summer offers plenty of time for it to develop enough biomass to suffocate and physically damage a water body. Be sure to include this plant on your "weeds to watch out for" list! Try planting pickerel weed (a native) instead, as it offers the same color flowers as water hyacinth.

Tools of the Trade

How to Make a Long-Handled Rake in Six Easy Steps!

By Erika Haug, Exotic Species Program Assistant

Sometimes you just need to get a plant in your hand to really determine what it is. Many plants, like bladderwort, coontail, milfoil, and fanwort look very similar when under water. By looking at them more closely, with the guides in your Weed Watcher Kit, you can determine if the specimen is suspicious. Here's how to make a long-handled rake.

Supplies:

1 broom

1 three-prong garden tool

2 flat-head screws long enough to go through both the broom stick and garden tool handle (about 2½ inches long should work well)

1 electric drill

1 hand saw

1 flat-head screw driver

1 wrench

2 bolts the size of the screws you are using

Assembly Instructions:

Step 1: Saw the end off of the broom so that you are left with just the broom stick (or purchase just a broom stick handle if available).

Step 2: Pre-drill two holes into the handle of the garden tool about two inches apart from center to center, using a bit suitable for the size of the screw you are using. Place the first hole about an inch and a half up from the end of the broomstick. This puts the second hole about 3½ inches from the end of the broomstick.

Step 3: Pre-drill two holes in the base of the broom about an inch and a half from the sawed off end. Space them the same distance apart as the two previous holes (about 2 inches).

Step 4: With the garden tool prongs facing away from the broom stick align the two sets of holes.

Step 5: Using the flat-head screw driver, screw the screws through first the garden tool then the broom stick in both sets of pre-drilled holes.

Step 6: Secure the screws in place with a bolt on the end of each screw. Use a wrench to tighten the bolts. And there you have it … your very own weed rake.

Use:

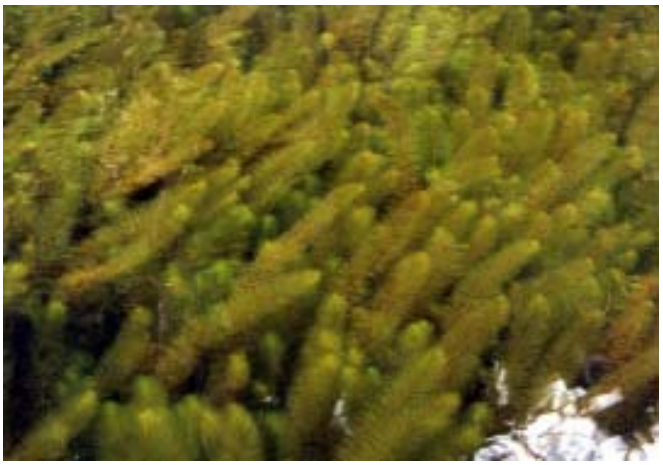
You are now ready to use your weed rake. While out doing your monthly Weed Watching activities, you can use your weed rake to collect specimens of plants that are too deep to simply gather by hand. Simply use the rake to reach the plant, and either dislodge one individual plant from the sediment and pull it into your boat, or carefully snap off a good sized piece of the plant. Make sure to remove all pieces of plants from the water and don't leave fragments. Once you've examined your specimen, you can determine if you need to send it to DES for further identification. If you need identification assistance, please follow the instructions for mailing plants in your Weed Watcher Kit.

A Local Lake's Tale of Milfoil

A New Program To Remove Milfoil, but ...

By S. Edward Neister, Chairman, Suncook Lake Association Milfoil Control Committee

Last year's *Weed Watchin'* discussed the importance of having Weed Watchers on our lakes and ponds in New Hampshire. We are now encouraging local lake associations to take action using a systematic program to remove variable and Eurasian milfoil from the lake or pond. Until New Hampshire and New England residents take action collectively, we are not going to win the war against these invasive exotics.



Variable milfoil in Suncook Lake, Summer 2004

Lake Associations Must Act

Variable milfoil has infested about 65 lakes and ponds in this state. This noxious weed's rapid growth (up to half-foot per week) makes it critical that Weed Watchers find it and notify both DES and their local lake association immediately. Constant monitoring of aquatic plant communities is a rigorous task, and requires both state and local vigilance. Because treatment is so labor intensive, local lake associations must organize volunteers as soon as sightings of the plant are confirmed. It takes one to two years to get the necessary organization, paperwork and permits in place to begin the process of conducting an herbicide application.

If no action is taken, rest assured that the variable or Eurasian milfoil will not go away. It will continue to multiply ten fold in new coverage each year. Without treatment, exotic milfoil fragments will be found on all shorelines from early spring to late fall, and sightings of plants lying just below the surface will become more numerous.

Within the next few years, sections of the lake or pond will not be available to recreation because of plant fouling of props and intake ingestion, and a decreasing fish population. Also, exotic milfoil near shorefront beaches and properties can greatly reduce real estate values. Even more frightening, milfoil has been linked with drownings in several lakes and ponds across the United States.

Suncook Lake's Program

Last year, Suncook Lake Association (SLA) developed and tested a new program for the removal and, hopefully, eradication of variable milfoil in Lower Suncook Lake.

The Lower Lake had become so infested that about 30 percent of recreational area would have been lost by the summer 2005. In the fall of 2003, the lake association applied for a grant to treat variable milfoil in Lower Suncook Lake using 2, 4 – D herbicide. Part of the grant was to develop a plan that could remove all the milfoil or at the very least provide the means to get it under control.

This program became known as "STOP Milfoil" (for *Survey*, *Treatment*, *Observe*, *Pull* and *Monitor*). It is a process where underwater surveys locate all the milfoil using GPS and visual spotting by divers. Treatment is done only using the 2, 4-D systemic herbicide as described in last year's *Weed Watchin'*. Three to four weeks after treatment, underwater surveys were conducted to observe the effects and record the location of any surviving plants. Because the treatment was so precise, Suncook Lake did not have any surviving plants in the treated areas. If any plants do survive, they must be pulled immediately by divers. This year and all future years, divers will monitor the lake condition and look for any milfoil plants. We plan to do it twice each summer, in June and in August. If any plants are found, their locations will be mapped and the plants immediately removed from the lake.

With this program, lake associations and DES have the ability for the first time to get the milfoil infestation

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Suncook Lake, continued from Page 5

under control. The STOP Milfoil program makes it possible to actually reduce future use of herbicides in this effort. However, laws in New Hampshire almost make its use impossible for most lakes and ponds in the state.

The Suncook Lake study showed that five wells between five and 17 feet from shore did not get any herbicide contamination. Lab tests done by the Engineering Research Group (ERG) at UNH showed that there were some actions available to decontaminate a well if such a thing does happen.

Credits

Many people donated much time and effort to making the Suncook Lake program a success. The SLA consists of over 250 homes around both the Upper and Lower lakes. All voted in favor of the treatment and program. The SLA formed a Milfoil Control Committee consisting of 10 members. A diver group was formed that consisted of eight divers and six boat and computer operators. Numerous volunteers help distribute literature and information around the lake containing notices of treatment and requirements for well owners and people who used black pipe to draw water directly from the lake. Residents did not drink their well water for 30 days and did not swim for seven days following treatment. All people using black pipe removed it from the lake until 30 days after treatment.

The end result was we got rid of our milfoil. And we will survey the lake twice a summer ... or until there is no milfoil in New Hampshire and New England.

We hope all lake associations in the state join us by getting rid of their milfoil. We want to wish you well in your efforts. We all must succeed. There is no other choice.

For further reading, a copy of the report prepared by UNH and the Suncook Lake Association can be accessed via the DES website at www.des.nh.gov/wmb/exoticspecies/Suncook_Lake_Milfoil_Research_-Proj_F_R.html.

Aquatic Control Technologies, Inc. preparing for 2,4-D treatment of Suncook Lake, June 2004

Variable Milfoil Research Projects, cont.

Project Title	Lead Researchers	Anticipated Cost/Status
Evaluation of Seven Aquatic Herbicides for the Selective Control of Variable Milfoil	Dr. Kurt Getsinger and Dr. Mike Netherland, US ACOE, Waterways Experimental Station	$200,000- Approved
Using Dispersal and Environmental Variables to Predict Milfoil Occurrence and Succeptibility to Invasion by Non-Native Milfoil in New Hampshire Lakes	Dr. Ryan Thum, Cornell University and Dr. Jay Lennon, Brown University	$50,000- In review
The Effects of Water and Sediment Chemistry, Sediment Physical Properties, Number and Size of Contiguous Wetlands, and Watershed Geology in Variable Milfoil Abundance or Presence/Absence	Dr. Ken Wagner and Ms. Wendy Corbin, ENSR International	$89,566- Approved
Variable Milfoil Plant Replacement Project	Dr. Ken Wagner and Ms. Wendy Corbin, ENSR International	$69, 550- Approved
Suction Harvest Removal of Variable Milfoil from Lake Massasecum (Part of VMF Plant Replacement Project)	Chemfree Aquatics, Jeff Galven	$55,000- Approved
An Exploration of the Use of Parasitic Nematodes for the Biological Control of Variable Milfoil	Mr. Jeff Schloss, Dr. Garrett Crow, University of New Hampshire	$225,000- Approved
Integration of Hydroacoustic and Water-Quality Related Assessments for Identifying Suceptible Areas for Variable Milfoil	Jeff Deacon, Richard Kiah, and Jane Denny, U.S. Geological Survey	$110,000- In review

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table above summarizes the research projects (please note that though the table shows seven projects, the plant replacement project and the suction harvesting project are actually one project).

Research will focus on two key areas: risk assessment and management/control. Three of the six projects will focus on examining various aspects of water quality data and sediments to determine commonalities between environmental and spatial data as they pertain to variable milfoil populations in New Hampshire and beyond. Some genetics work will also be involved in identifying milfoil species.

With this information, DES hopes to be able to better predict the characteristics of lakes, ponds, and rivers that can support variable milfoil growth based on the results of the studies. In waterbodies with the key characteristics, efforts at prevention and early detection of variable milfoil will be increased.

The remaining three projects will focus on various aspects of control, including herbicide bioassays, biological control, and plant replacement techniques. The goal here is to find herbicides and biological controls that are most effective on stemming variable milfoil growth in waterbodies, while avoiding impacts to non-target species. It is hoped that if variable milfoil populations can be kept in check through the use of herbicides and biological controls (integrated pest management practices), that native plants may have a better opportunity to grow in and limit the growth of variable milfoil.

Stay tuned to future updates!

Variable milfoil in Lake Winnipesaukee, Gilford

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Weed Watcher T-shirt Graphic Art Contest!

As some of you may recall, approximately five or six years ago, DES had ordered a batch of Weed Watcher t-shirts so that we could give them out to volunteers participating in the program. Due to lack of funding, we are no longer able to give out t-shirts for free, but we do recognize that many lakes would like to have "official" shirts to wear while conducting their Weed Watching activities.

We have decided to order a batch of shirts, and we will be offering them for sale at the cost of production (to be determined). To do this, however, we would like to include a graphic on the back of the t-shirt to show off some Weed Watchers in action. It would be great if that artwork came from one of our artistic Weed Watchers! If you have an artistic flair and would like to submit graphics for our consideration, you may just have your artwork displayed on the back of the t-shirts! And, as added incentive to submit something, the winning artist will receive a special prize!

Artwork should be easily reproducible in the silk screening process. It can be computer generated free-hand drawings. Watercolors or other hard to reproduce materials should be avoided. We can make the back of the shirts in full color, so if you would like to include a splash of color in your graphics, please do. Please note that all graphics submitted for the contest become the express property of DES for use for this or other related materials or publications.

Once we have the graphics, DES will work with a screenprinter to estimate the costs for the shirts, and then we will pass this information on to our active Weed Watching groups so that you can order shirts.

If you are interested in submitting graphics, please send them to Amy Smagula at asmagula@des.state.nh.us, or NHDES, PO Box 95, Concord, NH 03302-0095. If you have questions, please call (603) 271-2248. Graphics must be submitted no later than December 15, 2005 to be eligible. The winner will be notified in January 2006, and t-shirts will be available in spring 2006.